I would like to thank the authors for the detailed and clear response to the reviewer's suggestions. For this round, the tracked changes document was used for revision.

General comments

It could be worth it to also plot the sulphate normalized to the chloride concentration (e.g., SO4/Cl) to account for the dilution affect due to porewater freshening (as a check). The downcore decrease in sulphate namely is both due to mixing with the freshwater that is low in sulphate, and consumption through for example sulphate reduction. By not normalizing against Cl, you cannot differentiate between the two effects. This also might affect where you place your SMTZ, and thus influence the porewater chemistry and archaeal community composition mismatch.

Specific comments

#1 Lines 58-59: "These findings highlight the complex interplay between freshened porewater and gas seepage in shaping archaeal communities, iGDGT composition, and the sedimentary record." In the sentences leading up to this one, the conclusion is that pelagic AOA is more important for the iGDGT composition. However, in this more conclusive sentence that does not seem to be represented as only freshened porewater and gas seepage are highlighted as environmental controls?

#2 Line 98: "In shallow and coastal Baltic regions such as the Bay of Puck, SGD is often described as the movement of recirculated seawater and its dissolved constituents (Piekarek-Jankowska, 1996; Szymczycha et al., 2016)." However, the Szymczycha et al., 2016 paper describes very freshened porewater at their SGD sites, how does this connect to the recirculated seawater?

#3 Lines 112-114: "In the Gdańsk Basin, pockmarks, Cl- and SO42- depletion linked to freshened porewater discharge may weaken SO42--driven anaerobic methane oxidation (S-AOM), promote shallow methanogenesis, and contribute to episodic gas release into the water column." Do you have a reference for this?

#4 Line 440: How were the SMTZ midpoints and ranges defined? The MET3 estimated SMTZ interval in Figure 2 seems for example very thin to me when compared with the sulphate and methane gradients that change over a much broader depth. Furthermore, I would suggest to use consistent units for the methane, sulphate and chloride (that is; mM), but I leave that choice to the authors.

#5 Line 992: "Lipid preservation could also be a side effect of the less ebullitive nature of methane seepage in pockmarks P/MET3 and P/MET4: the kinetics and episodicity of CH4 supply and freshened porewater discharge, which influence redox zonation." This sentence and the causal relation are unclear to me. Can it be specifically made clear how more consistent CH4 supply/less episodicity as typically associated with ebullition change the redox zonation?

#6 Lines 1023-1039 in section 4.5 Porewater freshening and potential alternative methane oxidation pathways: This is all very useful background information, but I miss a bit the link and bridge to your data and results. Do you also see any of these processes reflected in your results? Or are there any discrepancies with previously published literature?

#7 Lines 1205-1210 in Conclusion: Perhaps add a more specific sentence on the implications of your findings for using iGDGTs as proxies for methane seepage and SGD.

Technical corrections

1 In “Highlights” line 27: abbreviation AOA is not introduced.